

## Pima County Regional Wastewater Reclamation District, Arizona

### Deploys Real-time H<sub>2</sub>S Monitoring To Pinpoint Problematic Sites

Pima County Regional Wastewater Reclamation Department (RWRD) serves 280,000 customers across the Tucson area, covering 420 square miles, 5 jurisdictions, and 2 tribal nations. Vast coverage areas include urban and suburban populations with numerous mountain ranges resulting in large elevation swings. RWRD maintains and operates 3,500 miles of sanitary sewer lines, 67,000 manholes and 8,400 public cleanouts. Pima County's unique landscape includes climate temperatures ranging from the low 60's in winter months to the 100's during the spring and summer months.

#### The Challenge

Due to high temperatures and extensive network of sewer lines, RWRD experienced high H<sub>2</sub>S levels throughout their collection system. The Conveyance Division wanted to monitor problematic sites to validate known issues and discover any unknown issues which could cause potential health hazards to employees and the public; nuisance due to smell; and pipe corrosion and damaged infrastructure causing lower asset life and a threat to the Sanitary Sewer System environment (i.e., SSO's).

Prior to deploying real-time smart sewer technology, reactive dosage amounts performed at Chemical Dosing Units (CDU) were based on odor complaints and historical H<sub>2</sub>S data collected with loggers deployed and retrieved several times per month. Managing both the Liquid Phase and Vapor Phase Odor Control Program using this approach resulted in higher chemical and labor costs and created greater inefficiencies.

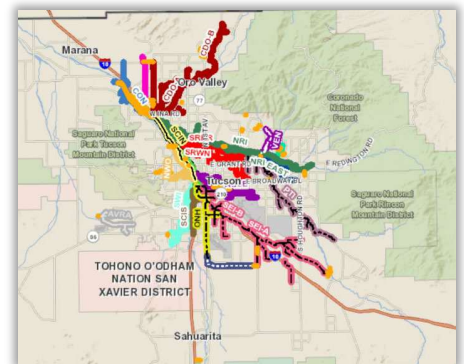
#### The Solution

To take a more proactive and targeted approach, RWRD deployed a network of 47 SmartCover real-time satellite monitoring H<sub>2</sub>S units to provide real-time, low-cost hydrogen sulfide monitoring at problematic sites across the collection system.

The SmartCover solution is a self-contained system that provides reliable, real-time measurement over extended periods of time and allows targeted mitigation strategies. The 0-1,000 ppm H<sub>2</sub>S sensor has a minimum 3-month calibration interval, resulting in only 4 site visits a year vs. 26 visits per year with their previous data loggers.

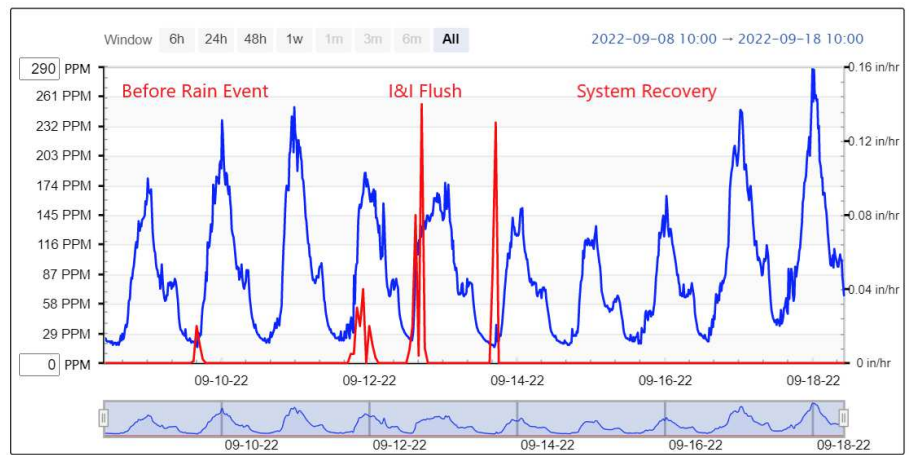
#### Highlights:

- **Greater ability and speed to identify and address problematic areas**
- **Better allocation of resources (staff and vehicle travel costs) based on work order evaluations**
- **Improved visualization of site conditions to make proactive vs. reactive decisions**
- **Optimized chemical dosing in existing locations and reallocated chemicals to new locations**



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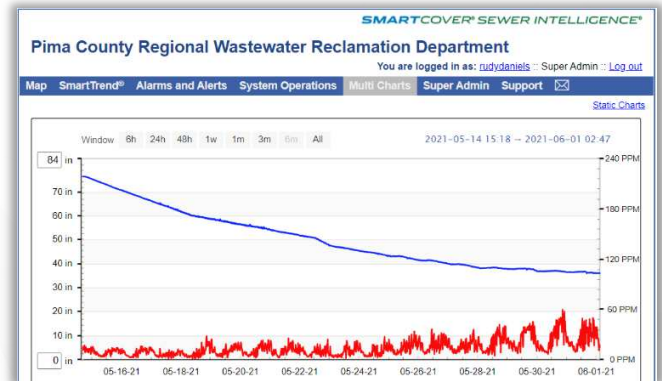
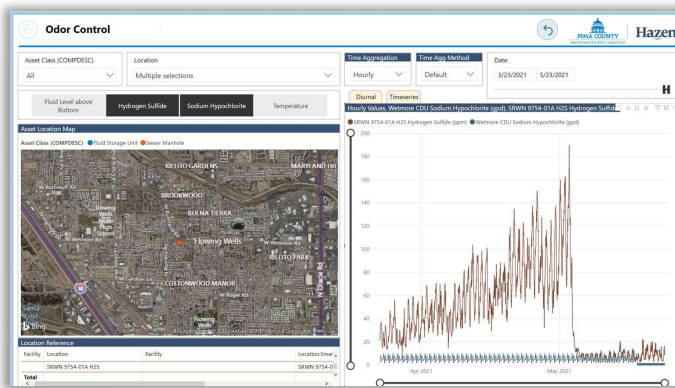
Data can be overlaid with existing level, flow or rain data. Integration with localized weather data from the National Oceanic and Atmospheric Administration (NOAA) provides an easy method to view and understand the impact rain events have on H2S levels. Data analytics and trend change advisories can provide insights on H2S levels throughout the duration of a rain event, helping to reduce odor control chemicals for periods of time within the system.



Overlay of rain data with H<sub>2</sub>S data

## The Results

The large amounts of data collected from the real-time H2S units allowed RWRD to better understand their system, pinpoint problem areas and fine tune chemical dosage (primarily magnesium hydroxide), in turn, optimizing resources to prevent asset degradation. RWRD was able to integrate the H2S data with their asset management system which gave them the ability to monitor CDU dosing changes and, within an hour or two, see the H2S level change based upon the dosing values applied; reduce chemical dosing based on live trend H2S values; and determine the required usage based on CDU tank level volume to not only extend chemical usage, but to also use the chemical more efficiently.



With the application programming interface (API) integration, 25,000 sensor data points were pulled into the MS Power BI platform for evaluation along with the Asset Management system (Infor IPS).

## Conclusion

In addition to a better overall understanding of the system, RWRD has been able to quickly identify and address problematic areas, including CDU site dosing, by evaluating reported conveyance system conditions in order to dose ahead of known daily high H2S values. Smart sewer technology has allowed RWRD to minimize field visits and better allocate resources (staff and vehicle travel costs) based on work order evaluations delivering a notable return on investment.

RWRD has gained improved visualization of site conditions leading to a more proactive versus reactive decision-making process, especially in times where attrition and knowledge transfer is problematic. The creation of visual baselines and development of key performance indicators (KPIs) has minimized issues and alleviated known odors. And, the 24/7/365 eyes and ears of the sewer allow real-time evaluation of any changes in the system, making chemical dosing dynamic, thus allowing for reduction in chemical costs and/or allocation of saved chemicals to timeframes when chemical is needed.